REMARKS

The Examiner is thanked for the thorough examination of the present application, and for correctly indicating the allowability of the subject matter of Claims 4-6, 9, 13-15, 18, 22-24, and 27. Dependent Claims 7, 16, and 25 have been amended to correct the noted informalities, as helpfully pointed out by the Examiner. Independent Claims 1, 10, and 19 have been amended to more clearly define the subject matter thereof over the prior art. Support for the amendments may be found in paragraphs 0044-0045 of the originally filed specification, for example. No new matter is being added.

In view of the amendments and supporting arguments presented in detail below, it is submitted that all of the claims are patentable.

I. The Claimed Invention

The present invention is directed to a free space optical (FSO) communications device. As recited in independent Claim 1, for example, the FSO communications device includes a plurality of power supplies having different respective output voltages, and an adaptive optics (AO) module including an AO housing and a deformable mirror carried thereby. The deformable mirror includes an array of actuators each operating based upon a supplied voltage. Furthermore, a power controller is for determining a lowest one of the output voltages that will cause the deformable mirror to correct a given optical wavefront

distortion. The power controller also selectively drives the array of actuators using the power supply providing the determined lowest output voltage to conserve electrical power.

Independent Claim 10 is directed to a related FSO communications system. Furthermore, independent Claim 19 is directed to a related power conservation method for an FSO communications device.

II. The Claims Are Patentable

The Examiner rejected independent Claims 1, 10, and 19 under 35 U.S.C. §102(e) over U.S. Patent Publication No. 2004/0017620 to Kaneko et al. This reference is directed to an optical unit including a first substrate having fixed electrodes, a second substrate having a sheet-like member, and a moving plate-spring actuator electrode. Concentric through holes are provide at the middle of the sheet-like member of the first substrate and the second substrate, and an optical element, such as a lens, a mirror, or a prism, is mounted to the through hole of the sheet-like member. When voltages applied between the fixed electrodes and the moving electrode are controlled, the sheet-like member is displaced to deform the optical element. See, e.g., paragraphs 0011-0016 of Kaneko et al.

In particular, the Examiner points to an embodiment illustrated in FIG. 18 and described in paragraph 0159 of Kaneko et al., contending that the variable resistors **34** therein provide the claimed plurality of power supplies, and that an arithmetical

unit **38** provides the claimed power controller recited in the above-noted independent claims. The relevant portion of paragraph 0159 and FIG. 18 of Kaneko et al. are reproduced below.

> "[0159] FIG. 18 shows another embodiment of the deformable mirror **33**. In this embodiment, a piezoelectric element **33c** is interposed between the thin film **33a** and the electrodes **33b**, and these are placed on a support **48**. A voltage applied to the piezoelectric element **33c** is changed in accordance with the individual electrodes **33b**, and thereby the piezoelectric element **33c** causes expansion or contraction which is partially different so that the shape of the thin film **33a** can be changed. The configuration of the electrodes **33b** may be selected in accordance with the deformation of the thin film **33a**. For example, as illustrated in FIG. 19, it may have a concentric division pattern, or as in FIG. 20, it may be a rectangular division pattern. As other patterns, proper configurations can be chosen. In FIG. 18, reference numeral **49** represents a shake sensor connected to the arithmetical unit **38**. The shake sensor **49**, for example, detects the shake of a digital camera and changes the voltages applied to the electrodes **33b** through the arithmetical unit **38** and the variable resistors **34** in order to deform the thin film **33a** to compensate for the blurring of an image caused by the shake. At this time, the signals from the temperature sensor **39**, the humidity sensor **40**, and range sensor **41** are taken into account simultaneously, and focusing and compensation for temperature and humidity are performed. In this case, stress is applied to the thin film **33a** by the deformation of the

piezoelectric element **33c**, and hence it is good practice to design the thin film **33a** so that it has a moderate thickness and a proper strength."

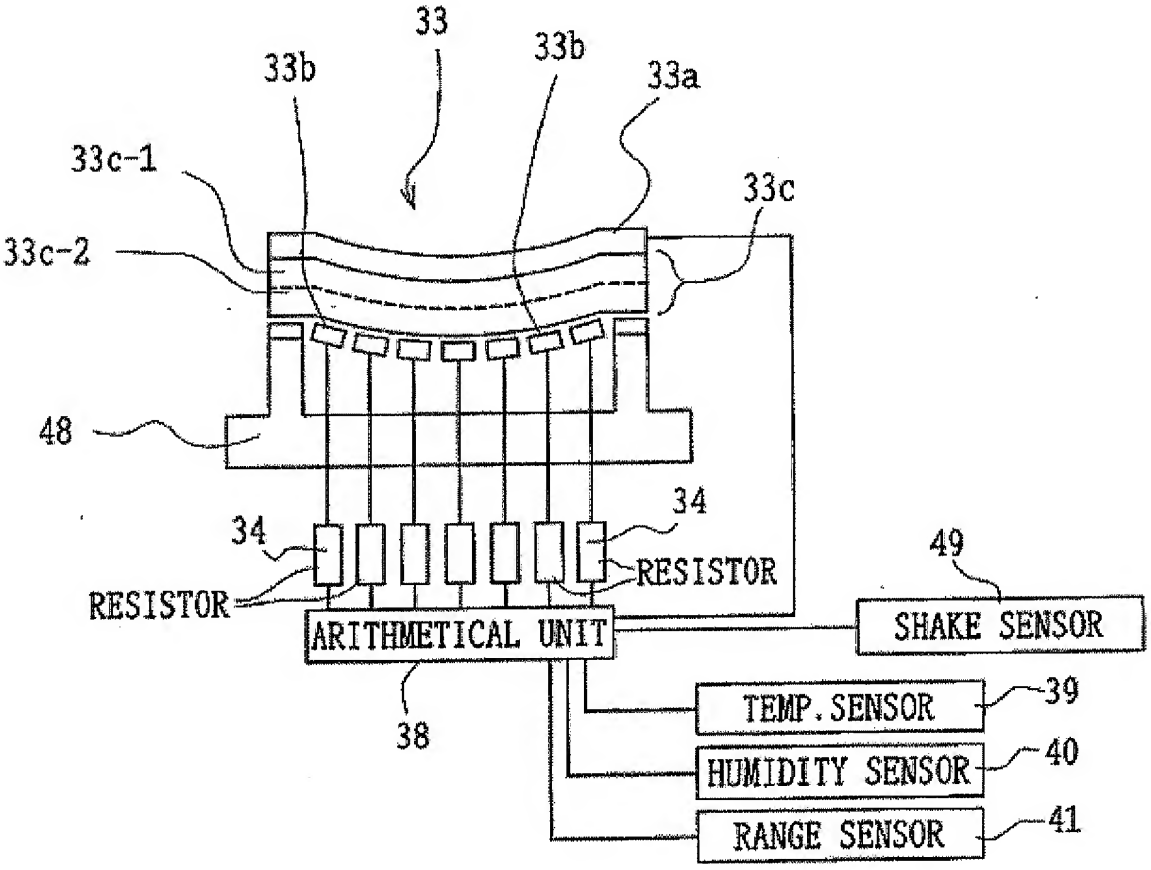

FIG. 18 of Kaneko et al.

Independent Claims 1, 10, and 19 have been amended to recite that the power controller is for determining a lowest one of the output voltages from the plurality of power supplies that

will correct a given optical wavefront distortion, and for selectively driving the array of actuators using the power supply providing the determined lowest output voltage to conserve electrical power. As discussed at paragraphs 0045-0046 of the originally filed specification, by selecting the appropriate one of the power supplies that provides the minimum or lowest appropriate voltage to correct the distortion, the entire array of actuators need not be supplied with the maximum available voltage all of the time, which may provide significant power consumption savings. Moreover, because of the reduced power consumption, the FSO communications device may be sufficiently powered using only a battery source in some applications and avoiding a direct connection to a high voltage source.

Yet, Kaneko et al. merely teaches that the arithmetical unit **38** thereof adjusts the resistors **34** so that the piezoelectric elements **33c** are driven to deform the thin film **33a** into one of a concentric division pattern or a rectangular division pattern to compensate for blurring caused by shaking. Nowhere does this reference teach or fairly suggest determining a lowest output voltage that will correct a given optical wavefront distortion, and selectively driving an array of actuators using a power supply providing the determined lowest output voltage to conserve electrical power.

Since none of the remaining prior art of record teaches or fairly suggests the noted deficiencies, it is submitted that independent Claims 1, 10, and 19 are patentable over the prior

art. Their respective dependent claims, which recite yet further distinguishing features, are also patentable over the prior art and require no further discussion herein.

CONCLUSION

In view of the foregoing, it is submitted that all the claims are patentable. Accordingly, a Notice of Allowance is requested in due course. Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,

JOHN F. WOODSON, II
Reg. No. 45,236
Allen, Dyer, Doppelt, Milbrath
& Gilchrist, P.A.
255 S. Orange Avenue, Suite 1401
Post Office Box 3791
Orlando, Florida 32802
407-841-2330
Attorney for Applicants